

WHAT IS CLAIMED IS:

1. A bone fixation device, for securing a first bone fragment to a second bone fragment, comprising:

an elongate pin, having a proximal end and a distal end;

at least one axially advanceable anchor carried by the pin;

an actuator, axially moveable with respect to the pin in a distal and a proximal direction, wherein axial proximal movement of the pin with respect to the actuator causes at least a portion of the anchor to advance along a path which is inclined radially outwardly from the pin in the proximal direction;

a retention member, axially moveable with respect to the pin, and

at least one retention structure in between the pin and the retention member for permitting proximal movement of the pin with respect to the retention member but resisting distal movement of the pin with respect to the retention member.

2. A bone fixation device as in Claim 1, wherein the anchor comprises at least one axially extending strip carried by the pin, the strip moveable from an axial orientation to an inclined orientation in response to axial proximal retraction of the pin with respect to the actuator.

3. A bone fixation device as in Claim 2, wherein the anchor comprises at least two axially extending strips.

4. A bone fixation device as in Claim 3, comprising four axially extending strips.

5. A bone fixation device as in Claim 2, wherein the strip has a proximal end and a distal end and the proximal end is free.

6. A bone fixation device as in Claim 5, further comprising a hub carried by the pin, and the distal end of the strip is connected to the hub.

7. A bone fixation device as in Claim 6, wherein the hub comprises an annular ring, axially movably carried by the pin.

8. A bone fixation device as in Claim 6, wherein the hub is fixed with respect to the pin.

9. A bone fixation device as in Claim 1, further comprising a first retention structure on the retention member for cooperating with a second retention structure on the pin to retain the device under compression.

10. A bone fixation device as in Claim 1, wherein the actuator comprises a non-bioabsorbable material and the retention member comprises a bioabsorbable material.

11. A bone fixation device as in Claim 1, further comprising a tapered surface on the distal end of the actuator, so that proximal retraction of the pin with respect to actuator causes the anchor to incline outwardly as it slides along the tapered surface.

12. A bone fixation device as in Claim 1, further comprising a blunt surface on the distal end of the retention member to prevent the anchor from inclining inwardly.

13. A bone fixation system for fixing two or more bone fragments, comprising:

- a first elongate tubular body, having a proximal end, a distal end and a longitudinal axis;

- a distal anchor on the fixation device, moveable from an axial orientation for distal insertion through a bore in the bone to an inclined orientation to resist axial movement through the bore;

- an elongate pin axially moveable within the first tubular body and linked to the anchor such that proximal retraction of the pin with respect to the tubular body advances the distal anchor from the axial orientation to the inclined orientation;

- a second elongate tubular body, having a proximal end, a distal end and a longitudinal axis; and

- at least one retention structure in between the second elongate tubular body and the elongate pin, for permitting proximal movement of the elongate pin with respect to the second elongate tubular body but resisting distal movement of the pin with respect to the second elongate tubular body.

14. A bone fixation system as in Claim 13, wherein the second elongate tubular body comprises a retention structure for maintaining compression across a fracture.

15. A bone fixation system as in Claim 13, wherein the distal anchor comprises at least two axially extending strips spaced circumferentially apart around the pin.

16. A bone fixation system as in Claim 13, wherein the retention structure comprises at least one ramped surface that inclines radially inwardly in the proximal direction.

17. A bone fixation system as in Claim 13, wherein the retention structure comprises at least one annular ridge.

18. A bone fixation system as in Claim 13, further comprising a first retention structure on the second tubular body, and a second, complimentary retention structure on the pin.

19. A bone fixation system as in Claim 13, wherein the second tubular body comprises a first tapered surface and the pin comprises a second tapered surface such that proximal retraction of the pin with respect to the second tubular body causes a radial enlargement of the second tubular body.

20. A method of implanting a fixation device in a bone, comprising the steps of:
advancing an elongated pin and an actuator into the bone, the actuator being axially moveable with respect to the elongated pin;
axially moving the elongated pin with respect to the actuator;
engaging an anchor into bone in response to the axially moving step;
removing the actuator from the bone;
distally advancing a retention member along the fixation device, the retention member being configured to resist distal movement of the pin with respect to the retention member, and
proximally retracting the elongated pin with respect to the retention member.

21. A method of implanting a fixation device as in Claim 20, wherein the advancing an elongated pin and an actuator step comprises advancing the elongated pin into the bone before advancing the actuator into the bone.

22. A method of implanting a fixation device as in Claim 20, wherein the advancing an elongated pin and an actuator step comprises simultaneously advancing the elongated pin and the actuator into the bone.

23. A method of implanting a fixation device as in Claim 20, wherein the advancing an elongated pin and actuator step comprises advancing the fixation device through a predrilled bore.

24. A method of implanting a fixation device as in Claim 21, further comprising the step of seating a proximal anchor of the retention member against the bone prior to the proximally retracting step.

25. A method of fixing a first bone fragment with respect to a second bone fragment, comprising the steps of:

- advancing an elongated pin and an actuator through a first bone fragment and into a second bone fragment, the actuator being axially moveable with respect to the elongated pin.

- proximally retracting the elongated pin with respect to the actuator;

- advancing at least one tine on the fixation device into bone in response to the proximally retracting step;

- removing the actuator from the bone;

- distally advancing a retention member over the fixation device, the retention member being configured to resist distal movement of the pin with respect to the retention member, and

- proximally retracting the elongated pin with respect to the retention member to fix the first bone fragment with respect to the second bone fragment.

26. A method of fixing a first bone fragment with respect to a second bone fragment as in Claim 25, wherein the first and second bone fragments are separated by a fracture.

27. A method of fixing a first bone fragment with respect to a second bone fragment as in Claim 25, wherein the fracture comprises a malleolar fracture.

28. A method of fixing a first bone fragment with respect to a second bone fragment as in Claim 25, wherein the fracture comprises a condylar fracture.

29. A method of fixing a first bone fragment with respect to a second bone fragment as in Claim 25, wherein the fracture comprises an epicondylar fracture.

30. A method of fixing a first bone fragment with respect to a second bone fragment as in Claim 25, wherein the fracture comprises a colles fracture.